San Bernardino Symphony Orchestra and Exploring the Use of Mobile Applications by Symphony Orchestras

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Abstract

This report consists of an overview of the IT consultancy with the San Bernardino Symphony Orchestra (SBSO) and the implementation of the selected IT solution by the Client. The solution aimed to address the Client's need to attract more concert attendees and donors by providing a tool that leverages the power of data and geographic information systems (GIS) to identify untapped areas for potential outreach. In addition to this, the project team is interested in examining the use of mobile applications (apps) by symphony orchestras as another tool to enhance audience engagement and participation. We will evaluate the viability and effectiveness of mobile app usage for the purpose of increasing concert attendance. Data on industry IT expenditures, concert attendance, and mobile app usage will be analyzed to determine recommendations for symphony orchestras like SBSO.

Keywords: Information technology, GIS, non-profit organizations, symphony orchestras

1. Introduction

The art of classical music and symphony orchestra performances are pastimes enjoyed by many. There exists a diverse population of symphony orchestra performance attendees and patrons (Hager & Winkler, 2012; Ostrower, 2005). Regrettably, symphony orchestras have also experienced a decline in recent years and face persistent economic hardships. According to Rosen (2017), two major longitudinal studies on orchestras revealed a 13% decline in the proportion of the population that attended classical concerts between 2002 to 2008. More surprisingly, a 39% decline in attendance of college-educated adults was observed the same six-year period. Traditionally, education attainment has been known to be positively correlated with participation in the performing arts (Hager & Winkler, 2012).

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This opens the gates to other areas of research that seek to understand factors that contribute to concert non-attendance for interested audiences (National Endowment for the Arts, 2012). In a separate study, Rosen (2017) examines the churn rate for orchestra performances and found that the "aggregated churn rates across orchestras in nine major markets was 80% [sic]" (p. 21). In other words, only two out of every ten first-time attendees would return for another performance. Among several reasons cited, the most popular reasons first-time attendees did not return were the aggressive fundraising attempts that ensued their visit, poor parking, and the inability to exchange tickets (Rosen, 2017).

Another key issue that lends itself to the economic difficulties faced by the performing arts is the very nature of being non-profit organizations. According to Baumol and Bowen (1965), the dilemma often experienced by non-profits is the ability to easily expend new money as soon as it becomes available while experiencing difficulty financing other projects. Thus, non-profits constantly find themselves on the brink of "financial catastrophe" (Baumol & Bowen, 1965, p. 497).

In recent years, the proliferation of technological advancements has afforded a wide array of opportunities across various industries. However, access to such technology is still a challenge for certain industries, including non-profit organizations with limited financial resources. Non-profit organizations, like symphony orchestras, have the potential to propel to greater heights by leveraging the use of technology and overcoming these financial challenges. There is a growing interest in the utilization of technology in the areas of performing arts education and audience engagement. Certain technologies have been found to perpetuate interest-driven arts learning (Peppler, 2013). Moreover, studies have also shown changes in audience engagement due to technology and arts delivery methods (Arts Index, 2016).

The focus of this report will center around symphony orchestras and IT. We will begin with an overview of the IT consultancy and solution implementation for the San Bernardino Symphony Orchestra (SBSO) and expand on existing research in the realm of mobile application usage and potential for enhanced audience attendance.

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2. Overview and Client Needs

In the heart of the Inland Empire, the SBSO serves a diverse population of symphonic enthusiasts. The mission of the SBSO is to "foster a love of music, excite the spirit, and enrich [their] diverse community and region through live orchestral performances and music education" (San Bernardino Symphony Orchestra, 2017). The SBSO hosts five annual concerts at the historic California Theatre in downtown San Bernardino in addition to performing a variety of concerts throughout the region. Ticket sales, however, only represent approximately 20% of their annual income. In 2016, the total revenue for SBSO amounted to $493,186, nearly a 22% decline from the year prior. Donations and cash contributions accounted for 71% of the total revenue (Internal Revenue Service, 2016). Evidently, the generous contributions from patrons are key in supporting the SBSO with its mission. Presently, the SBSO is seeking to increase their concert attendance and donors. Aside from supporting the musical legacy of the orchestra, donors also help perpetuate the various music education programs throughout the local schools. Therefore, acquiring new donors is vital for the continued support of the SBSO. The organization does not have any software or system in place which could help them locate specific areas to concentrate in order to enlarge their potential donors.

2.1 IT Project Solution

The goal for the project management team was to provide the SBSO with the optimal solution which would help them identify untapped areas with potential to attract new concert-goers and help them elevate their donor base. Research for this project was conducted in various areas of IT as well as demographic and motivational factors that influence concert attendance (Hager & Winkler, 2012; Harlow, 2015; Reynolds, 2017). Research also sought to examine the software other symphonies are utilizing in order fulfill the same purpose. Upon completing this preliminary research, the team identified four different IT solutions to offer the Client and meet the requirements of the organization.

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During the first client briefing, the team offered the Client four possible IT solutions that leveraged the power of GIS: Business Analyst Online, Tableau, Google Maps and Bloomerang. After examining the four recommendations, the Client elected to have the team initiate work using Google Maps, as it met the budgetary constraints of the organization and the Client felt comfortable using Google software within the organization.

Software Name	Type/Services	Price
Tableau	1. Desktop Personal: Connect to files like Excel and Google Sheets. 2. Professional: Connect to hundreds of data sources. 3. Online: is the SaaS form of Tableau Server with maintenance, upgrades, and security fully managed by Tableau. Any browser or mobile device. 4. A license, with annual maintenance.	Tableau Desktop: Personal = $35 per month. Professional = $70 per month. Tableau Online: Fully Hosted = $42 per month.
Business Analyst	1. $500 per year. 2. Adding $100 per person. 3. 5 users minimum.	At least $1000 per year.
Google Maps	1. **Standard Plan:** For free and publicly available apps/websites, use the Standard Plan. 2. Free up to 25,000 map loads per day. 3. **Premium Plan:** If usage limits or require 24/7 technical support and an SLA, contact us for a Premium Plan.	**Standard Plan = FREE** **PREMIUM = $0.50 per day.**
Bloomerang	1. Donor Search 2. Bloomerang finding email	$5,500-$6,500 first year.

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	addresses for your constituents. 3. 0 - 1,000 records.	

After receiving approval from the Client, the team began the implementation phase by researching unconventional demographic and motivational factors that have been found to influence concert attendance. Factors such as voter registration and volunteerism were found to have a positive correlation with concert attendance and, consequently, charitable giving. According to Ostrower (2005), "the proportion of respondents registered to vote climbs from 73 percent among non-attendees up to 91 percent among frequent attendees [...] and doing volunteer work rises from 27 to 63 percent" (p. 7). Ostrower (2005) also found that frequent attendees were most likely to be donors. These factors would form the basis for the data collection and visualization in Google Maps for the Client.

The team utilized Google Fusion Tables as a means to generate density maps from different data sources and created a list of the top fifteen potential areas by zip code for the Client (see *Figure 1*).

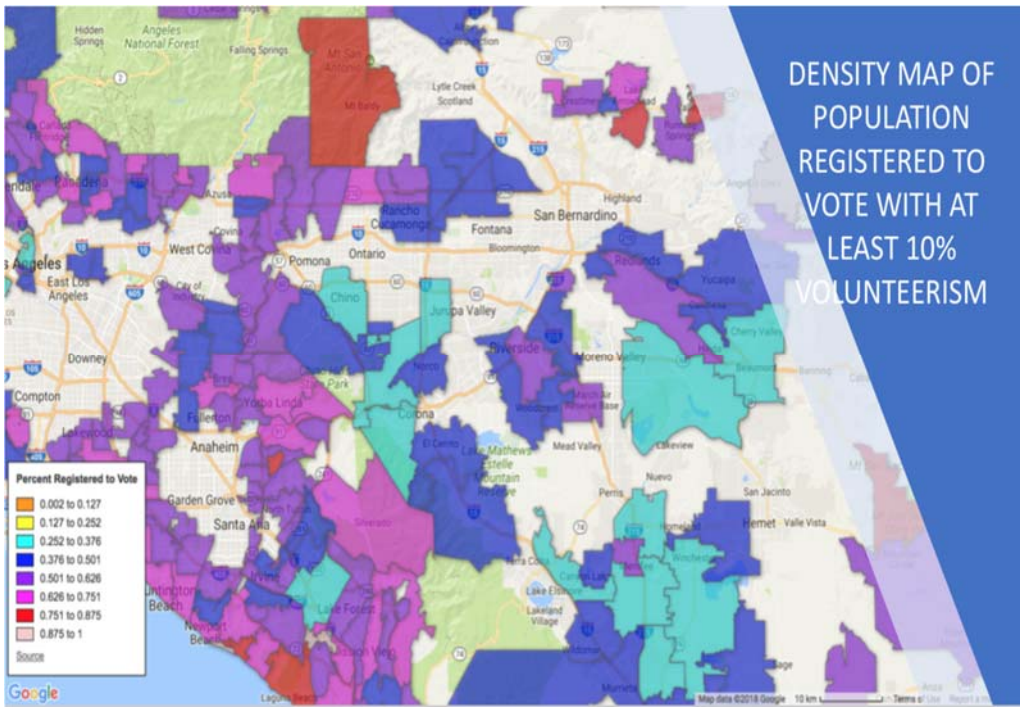

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Figure 1. Density map created using Google Fusion Tables displaying zip codes by percent of the population registered to vote and at least 10% volunteerism.

Google Fusion Tables is a web service provided by Google for data management (Google Inc., 2018). These tables are immensely helpful in assisting the user to gather, visualize, and share data available in the organization. Users can merge data from multiple tables and create detailed geographic visualizations from data. As the standard plan for the Google Maps is free, it makes Google Maps the ultimate option for small organizations that have limited financial resources to spend on data management tools and other IT solutions.

The team also sought to provide the Client with the proper tools that would enable them to adequately visualize the data and identify new geographical areas with higher concentrations of potential concert attendees using publicly available data. The scope of this project also included the delivery of tools and resources, such as a video tutorial and user guide, to aid the Client in utilizing the software.

2.2 Symphony Orchestras and Mobile Apps

The effectiveness of mobile apps for symphony orchestras like the SBSO will be examined through an analysis of symphony orchestra IT expenditures as well as mobile app usage and the demographics for mobile app users and orchestra audiences. Reasons for concert performance attendance and non-attendance will also be examined in relation to internet and app usage on mobile devices. Effectiveness will be defined as the viability for mobile apps, such as the Dubuque Symphony Orchestra (DSO) app, to be utilized by symphony orchestras for the purposes of engaging audiences. Establishing a viability could suggest the potential of drawing in new audiences through customized mobile apps for symphony orchestras like the Boston Symphony Orchestra (BSO) app. This research entertains the notion of igniting an interest in performing arts and bringing new musicians and audiences to symphony orchestras via mobile app technology.

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3. San Bernardino Symphony Orchestra and Exploring the Use of Mobile Applications by Symphony Orchestras Research

Non-profit organizations are increasingly using technology in their operations. By reviewing the mobile apps for both the BSO and DSO, we can examine the potential for other symphonies, such as the SBSO, to also offer a mobile app to its concert-goers. The BSO is like a path for a smaller organization such as the SBSO to have a better future. However, we also examine the DSO due to having a similar revenue and size as the SBSO while also offering a mobile app.

Considering that the user interface of a mobile app enhances the appeal and likeability of an app thus increasing usage and user loyalty. In extension, this contributes to the increased popularity of the non-profit symphony orchestra which translates to increased revenue for the symphony orchestra. Therefore, orchestras should leverage IT as demonstrated by the development of mobile apps in order to improve attendance and also increase their revenue streams.

The mobile app can help you in everything from planning your visit to purchasing tickets, enjoying digital content and direct engagement through social media plus helpful information while at the concert (Apple, 2018), reads the description to the BSO mobile app on the Apple app store. By mixing digital content and ticketing information related to the BSO, the app allows the orchestra to leverage mobile apps to reach out to fans, share exciting news on the orchestra's planned schedule (Apple, 2018), and communicate information related to the orchestra (Apple, 2018). While the SBSO does not have a mobile application, it is important to note that a mobile app would improve the attendance in SBSO events. According to the BSO, its presence on the Internet has significantly allowed it to attract the highest traffic among orchestras in the U.S. (Boston Symphony Orchestra, 2017). In other words, the mobile app creates awareness of the orchestra's events. In addition, the online presence through mobile and web platforms allows the BSO to promote art music through educational activities (Boston Symphony Orchestra, 2017) as well as attract sponsorship that is necessary for continued activities of the

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orchestra. Similarly, there are various mobile apps that could help the symphonies in attaining some new donors like Givelify—this is a free mobile app with non-profit donations with one account, all in one place. This sets up the organization's custom fundraising campaigns and sets donation goals so that the donors can decide where exactly they want their money to go (Givelify, 2018). As it is a free mobile app, every non-profit organization can get benefits from the app. Indianapolis-based Givelify LLC developed and marketed a mobile donation app, is expanding its headquarters and growing its profit largely by the year 2020 (IBJ, 2017). Effectiveness will be defined as the growth for the mobile applications like Givelify to be utilized by the symphony orchestra and music enthusiasts to engage more and more concert-goers and for supporting the arts as well. Moreover, the symphony orchestras can design their mobile apps based on the offerings they are going to present it to their concert-goers and donors. Apps for some orchestras like the Houston Symphony and Buffalo Philharmonic offer only short audio excerpts, while the London Philharmonic offers full works at time and brief excerpts at other times (Tedeschi, 2011).

In addition to looking at current symphony orchestra mobile apps, an analysis will be conducted using various secondary datasets from different sources, including the National Endowment for the Arts and the National Opinion Research Center (NORC). The Survey of Public Participation in the Arts (SPPA) is a rich repository for performing arts participation, behaviors, and demographics offered by the National Endowment for the Arts.

In conjunction, patterns in performing arts participation, motivations, and mobile app/Internet use will be analyzed using data gathered from the General Social Survey (GSS). The GSS is a project of the NORC at the University of Chicago and is among the most widely analyzed sources of information. The GSS features data on various societal attitudes, behaviors, and attributes (Smith, Marsden, Hout, & Kim, 2016). The data that will be used in the analysis includes responses from those who attended a performance in the last 12 months or wanted to attend a performance in the last 12 months but did not

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along with the factors that influenced their attendance. In addition, Internet/app usage on mobile devices for this population will be included for analysis.

Lastly, mobile app user behavior will be investigated in further detail through an analysis of the "Worldwide Mobile App User Behavior Dataset" (WMAUBD) (Lim, 2014). This dataset examines mobile app usage and motivations through a survey of 10,208 respondents across 15 countries. In order to make equitable comparisons, only U.S. data from the WMAUB dataset will be used. The survey also considers demographic information and Big Five personality traits of the respondents. An analysis of these three datasets will offer a greater understanding of current mobile app trends among various age groups. In turn, attitudes and behaviors toward the performing arts can be analyzed among the same age groups to determine the viability of symphony orchestras utilizing mobile apps to foster effective audience engagement.

3.1 Symphony Orchestras and IT Expenditures

The team has analyzed three symphony orchestras (BSO, SBSO and DSO) based on their expenditure in IT as reported in the IRS Form 990: Return of Organization Exempt from Income Tax. As compared to SBSO and DSO, BSO addresses a larger audience and their total annual expenses are far more than the two mid-sized symphony orchestras. Out of the three symphonies, BSO and DSO have launched their mobile apps and SBSO does not possess any mobile app yet. As Figure 2 demonstrates the percentage spent on information technology, it is clear from the figure that BSO and SBSO are spending almost the same percentage of their expenses in IT. Even when the percentage of expenses spent on IT is the same, SBSO is not able to increase its audience as compared to BSO. In the year 2014, BSO spent 1.63% of total expenses and SBSO spent 1.87% of their total expenses in IT. SBSO's percentage was greater than BSO in that particular year. SBSO is spending nearly the same expenses as of BSO but they are not able to increase the audience in their concerts.

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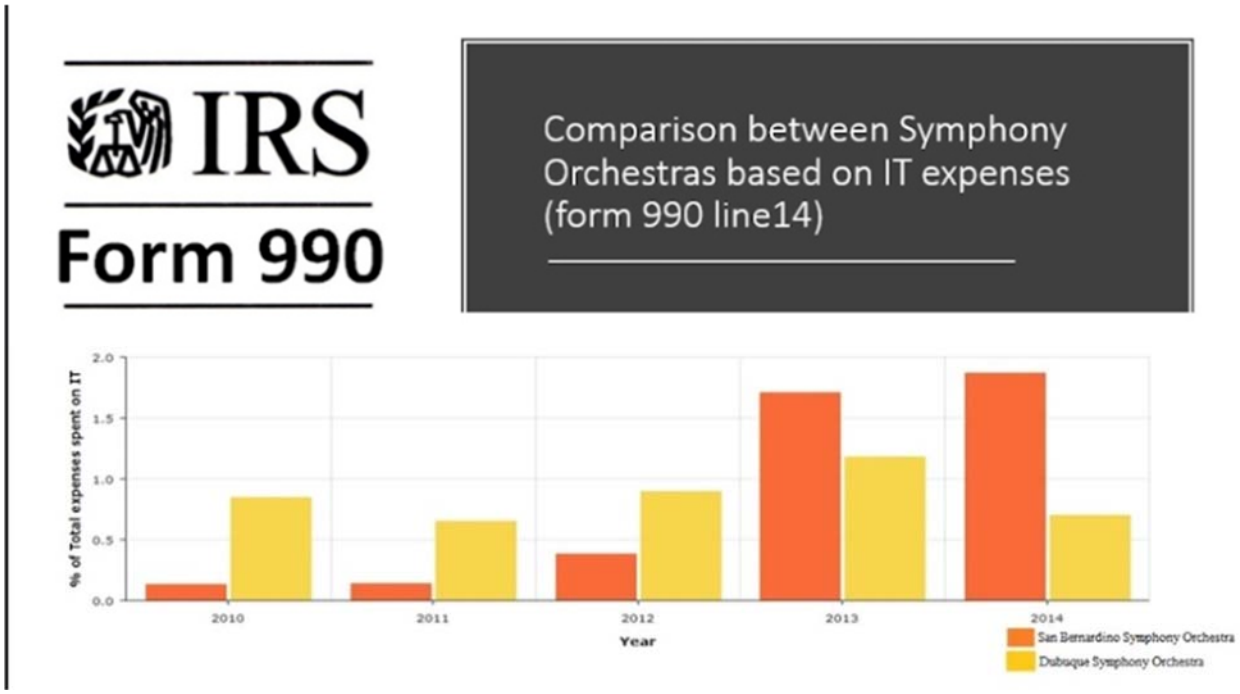

Figure 2: Comparison between symphony orchestras based on IT expenses.

The tax filings in 2015 show that the DSO had revenue of $1,076,359 with program services contributing 39.9% of the revenue compared to SBSO's revenue of $635,615 of which 32.1% was raised from program services. In addition, DSO recorded an income of $102,766 in 2015 and $1,096,018 in 2014. On the other hand, SBSO managed an income of -$67,066 and -$26,039 in 2015 and 2014 respectively. In 2013 and 2012, SBSO had an income of -$79,550 and -$62,651 compared to DSO's $77,860 and $188,758 respectively.

As SBSO is spending a significant proportion of their expenses on IT, they need to target on mobile apps and get prepared to launch one. It is clear that technology has already significantly changed the way people make, access and consume music. Online streaming services such as Spotify have completely disrupted the industry. In order to improve the customer experience and better engage audiences before, during, and after a performance, SBSO should launch its mobile app which would help them improve audiences and increase their potential donors.

3.2 Concert Attendance and Mobile App Users

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This analysis begins with responses from the General Social Survey (Smith et. al, 2016). Barriers for concert non-attendance as well as reasons for concert attendance among two sample populations, mobile app users and mobile app non-users, will be examined. These measures will be converted into proportions due to variance in both sample sizes. Reasons that are statistically significant can provide insight as to the tendencies of mobile app users and mobile app non-users with regard to concert attendance behaviors and attitudes and may suggest a course of action for symphony orchestras as well as assess the viability of mobile app usage for patron engagement.

Figure 3 displays the proportion of mobile app users and mobile app non-users that reported wanting to attend a performance within the 12 months prior to taking the survey but did not.

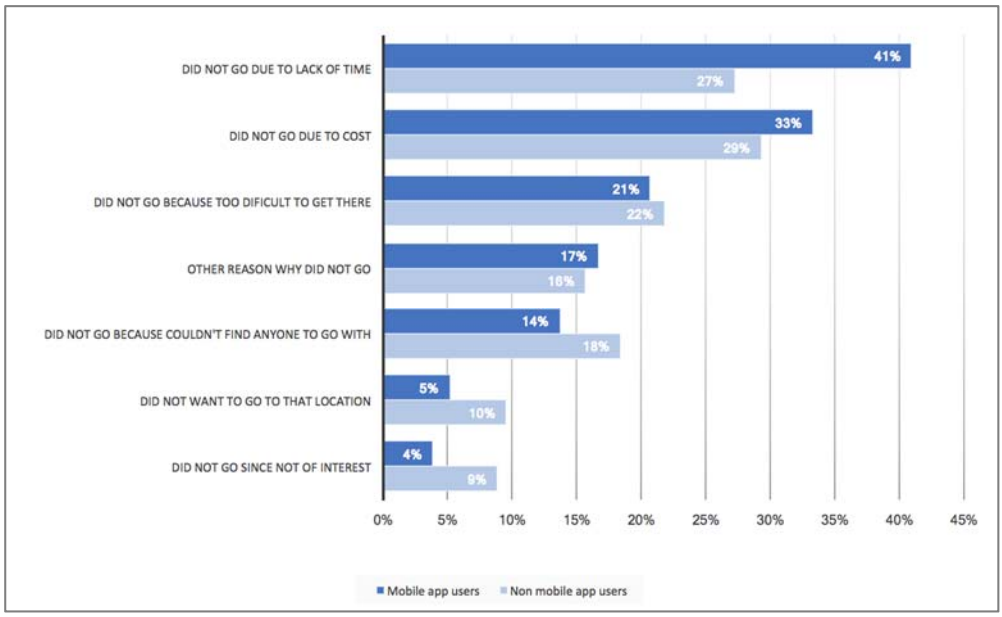

Figure 3:

The reason with the greatest disparity between the two populations, and the most popular reason for mobile app users not attending, was due to lack of time. Our null hypothesis is that there is no significant difference between the reasons why mobile app users and non- users did not attend a performance despite wanting to.

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A two-sample z-test between proportions was performed to determine whether there was a significant difference between mobile app users and non-users who did not attend due to lack of time. A significantly greater proportion of mobile app users ($\alpha = 0.01$) wanted to attend a performance but did not due to lack of time, $z(614)=3.057$, $p=.002$. The most popular reason among mobile app non-users for not attending was cost. We found that proportions between mobile app users and non-users that wanted to attend a performance but did not due to cost was not statistically significant, $z(614)=-0.924$, $p=0.356$. Mobile app users were 14% more likely to not attend a performance despite wanting to due to a lack of time. These results identify an area of focus for symphony orchestras seeking to implement a mobile app for prospective concert-goers. How can symphony orchestras appeal to their mobile app audiences knowing approximately 41% do not attend due to lack of time despite wanting to?

Next, we examine major reasons that affected a respondent's decision to attend a performance in the last 12 months. Again, we are examining two populations, mobile app users and mobile app non-users. Proportions will be measured due to variance in sample sizes. (Figure 4) reflects the proportion of respondents that reported the reasons listed as "major reasons" that impacted their decision to attend.

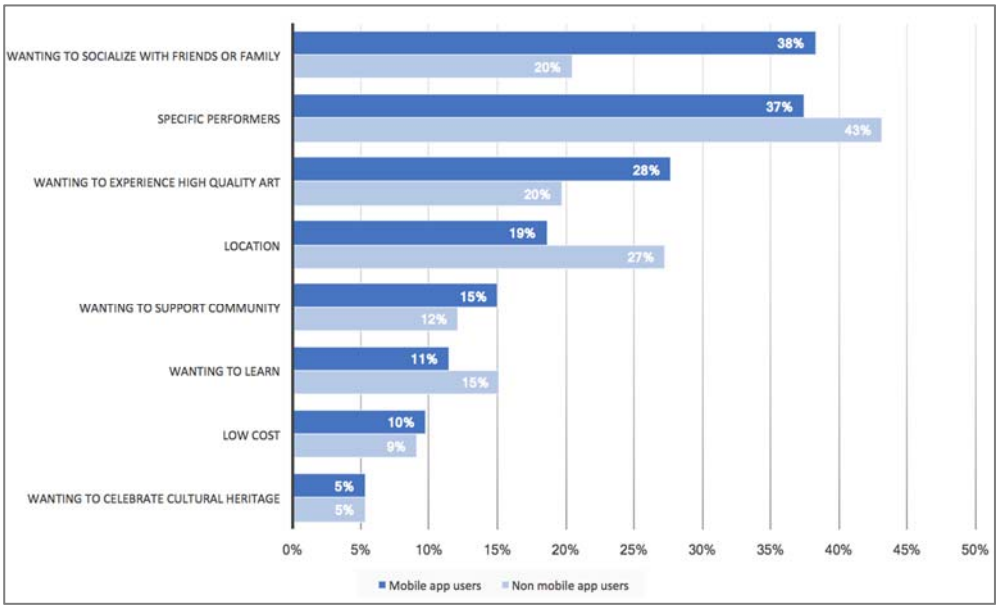

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Figure 4: Respondent went to a performance in the last 12 months. Importance of each reason in decision to attend performance. This figure illustrates reasons reported that had a major impact on their decision to attend the performance.

Among mobile app users, the most popular reason for attending was wanting to socialize with friends or family. Among mobile app non-users, the greatest reason that impacted their decision was the performance itself. The difference between mobile app users and non-users was found to be statistically significant ($\alpha = 0.01$) between those who reported wanting to socialize with friends and family as a major reason for attending. Mobile app users were 18% more likely to report socializing as a major reason that impacted their decision to attend a concert performance. Conversely, there is no significant difference between mobile app users and non-users that reported the performance itself as a major reason for attendance despite it being the most popular reason among mobile app non-users.

These findings allude to past research suggesting motivational factors among younger audiences include the desire to socialize (Hager & Winkler, 2012). This assumes mobile app users are primarily comprised of younger audiences. Without assuming age, symphony orchestras can benefit from knowing that prospective attendees who use mobile apps, suggesting they would utilize a symphony app, attend primarily for the social aspect. Symphony orchestras like the SBSO can implement a mobile app and include a socializing aspect in its design. Although age is not reported in this survey, the next comparison will consider age differences and similarities among mobile device users and classical concert attendance, and mobile app user behaviors and attitudes. We will assume that mobile device users will have an inclination toward mobile app usage.

Next, we examine the SPPA and the WMAUB dataset (National Endowment for the Arts, 2012; Lim, 2014). To test the assumption that mobile device users will have an inclination toward mobile app usage, we compare the mean ages in both sample populations using a two-sample t-test. Our null hypothesis is that there will be no significant age differences between mobile device users and mobile app users, irrespective of whether they attended a concert performance. Our results indicate that there are no

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significant differences ($\alpha = 0.05$) between average mobile app and mobile device user ages, $t(2750)=1.843$, $p=0.066$. Figures E3 and E4 illustrate the proportion of mobile app users by age from the WMAUB and the proportion of mobile device users and non-users from the SPPA that attended a live classical performance during the last 12 months, respectively.

The greatest proportions of mobile app users are represented in the 25-34 (24%) and 45-54 (21%) age groups as illustrated. The greatest proportions of mobile device users that attended a live classical concert are represented by the 25-34 age group (20%) and 55-64 (19%) age groups. The age group with the third highest proportion of mobile device users that attended a performance is 45-54 (18%). Given that the 45-54 age group is the second highest in mobile app usage and third highest in both mobile device usage and concert attendance, we can suggest that this age group may be more inclined to download a symphony orchestra app and predict that approximately 18% will attend at least one performance.

It is worth noting that the proportion of concert attendees increases with each age group for mobile device non-users. Seventy-five percent of mobile device non-users that attended a concert performance are age 55+. This population is viewed as traditional concert attendees; however, in order for symphony orchestras to survive, they will need to appeal to younger audiences. Mobile apps have the potential to increase engagement by appealing to ages 25-54 who have the propensity to utilize mobile devices and mobile apps as well as attend concert performances. This age range represents more than half (52%) of mobile device users that have attended a concert performance; therefore, we can predict that approximately 52% of people ages 25-54 that have a proclivity toward concert attendance, will also be inclined to use a mobile app.

provides a breakdown of mobile app user preferences from the WMAUB with regard to mobile app downloads. These reasons are considered when deciding whether a user will or will not download a mobile app. Symphony orchestra can gain valuable insight as to what they should consider when creating and implementing a mobile app.

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4. Findings and Observations

A mobile application offers a way and platform through which an orchestra is able to connect with its audience and disseminate this information to its followers. Effectively, this is a model through which an orchestra like SBSO is able to create a channel of direct engagement with its audience and provide them with digital content through the means of this platform. For instance, the BSO has been able to use its mobile app in creating an online conversation, creating a program schedule and enabling users to buy tickets for its events. Through the mobile app, the platform is able to create and disseminate digital content in the form of its audios which users can listen, share and download for local use. In addition, users can also create a playlist of their favorite music tunes. Consequently, the mobile app has enabled the orchestra to establish an ardent followership and a group of fans that resonate closely with the music and content that the orchestra offers (Apple, 2018).

In addition, the benefits of a mobile app are not just limited to its ability to create an ardent following, but also in enabling users to create their own music according to their taste through the utilities that it provides. For instance, a mobile app that has been created by Cadenza enables users to create music which resonates with musical possibilities as manifested in the course of expression. "The rich harmony and tapestry that it creates goes a long way in augmenting the process of music making and establishing a give and take music experience that closely resembles the course of typical conversation" (Apple, 2018). In this process of music making, the user has the ability to record themselves and equally create content which they can listen to themselves or share with others through this same platform.

In the process, the use of a mobile app also enabled the musical symphony like SBSO to generate new ideas about ways through which to improve their performance and music. In the process, they are able to improve their musical confidence as part of their delivery process. Further and even more important is the role that a mobile app plays in incorporating the benefits of artificial intelligence into the music making process. Through the mobile app and its utilities, it is possible to create adjustments in the playing so as to fit the content features that are part of the recording. For instance, the use of Cadenza

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enables the user to fit the playing instrument with in terms of tune tempo and orchestral performance by allowing the mobile app to listen and simulate the rest of these components in the process (Sona Cadenza, 2016). The mobile app thus enables users to discover and enjoy music as resonates with their heart, a component that is crucial, be it is the course of personal enjoyment or during the course of addition, thereby making the entire process relatively simpler, elaborate and more meaningful.

It is important to note that the BSO's mobile app allows for user review and criticism of the mobile app. The user review section allows the orchestra to improve the mobile app with regards to the consumer complaints (Apple, 2018). The involvement of users of the mobile apps also enhances brand image of the orchestras to the extent that it catalyzes interactive technology with regards to entertainment and educational values of the mobile apps (Palumbo, Dominici, & Basile, 2013). Users tend to identify with brands that enrich their life. In addition, the videos accessible on the mobile app act as a pull factor for converting online users of the mobile app to physical visitors to paid concerts.

After researching and using the IRS Form 990 for the non-profit organizations, many organizations profited. DSO was the closest in terms of revenue and expenses for IT and it may vary in each year but in a close range to compare. Where it was the most differences after the year 2011, where the SBSO drop in each year (Nonprofit Explorer, 2017), while DSO was improving until it reached its peak in 2014-2015, the same years that they doubled the expenses of IT (Nonprofit Explorer, 2017), showing us the importance of the IT and mobile apps. While the revenue for SBSO in the year 2016 was $493,186 (Nonprofit Explorer, 2017), the DSO generated $896,132 with an operational deficit of -$152,069 and -$89,241 (Nonprofit Explorer, 2017) respectively. The tax filings in 2015 show that DSO had revenue of $1,076,359 with program services contributing 39.9% (Nonprofit Explorer, 2017) of the revenue compared to SBSO's revenue of $635,615 of which 32.1% was raised from program services (Nonprofit Explorer, 2017). In addition, DSO recorded an income of $102,766 in 2015 and $1,096,018 in 2014 (Nonprofit Explorer, 2017). On the other hand, SBSO managed an income of -$67,066 and -$26,039 in 2015 and 2014 respectively (Nonprofit Explorer, 2017). In 2013 and 2012, SBSO had an income of -

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$79,550 and -$62,651 (Nonprofit Explorer, 2017) compared to DSO's $77,860 and $188,758 (Nonprofit Explorer, 2017) respectively.

Arguably, the ability of DSO to finance its expenses effectively is attributable to its absorption of technology in its activities. The rapid expansion of mobile-based application technologies allows a symphony orchestra to enhance its brand visibility and brand competitiveness. Promoting real time access news and updates on the DSO, the DSO mobile app is organized into several windows (AppShopper, 2018). The section on events allows one to gain useful information related to performance of orchestral repertoire with regards to dates and venues (AppShopper, 2018).

The free mobile app also allows fans of the DSO to enjoy video performances (AppShopper, 2018) of the DSO. Additionally, the section dubbed buzz makes it possible for individuals to follow the news (AppShopper, 2018) related to the symphony orchestra. The detailed information on events and news on the DSO mobile app allows individuals to obtain information related to performances leading to a high turnout during programs (Boice, 2014). Such a higher turnout during program services leads to increased generation of revenue through ticketing and patronage. Additionally, the integration of the app with social networking sites allows people to create awareness of the Orchestra's programs among people who do not use the app further enhancing the turnout and eventual fees collected through tickets.

5. Recommendations

The possibilities in the use of a mobile app for an orchestra are astounding. At some level, the mobile app and its utilities have the ability to deliver effectively and produce musical content which resonates closely and mirrors the output in a real orchestra. In this respect, the innate abilities of an orchestra mobile application and its cutting-edge algorithms would be beneficial and crucial in analyzing and generating content to the desires and intricate requirements that would be part of the orchestra (Sona Cadenza, 2016). The mobile app utility would contribute in creating new music and enabling the users to

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augment and leverage on their ability through an improvement in utility that this technology provides. For these reasons, there is much that SBSO stands to gain from a mobile app for its orchestra.

Nonprofit organizations should leverage technology to expand generation of revenue. The organizations should design user intuitive mobile apps to enhance user experience and maximize educational and entertainment utility of their apps. Apps that enrich user experience often lead to increased attendance during events organized by the non-profits. Improved attendance during events increases revenue thus allowing organizations to cover their running expenses. Overall, non-profit organizations should leverage technology to increase attendance and revenue.

6. Strategic IT Plan for SBSO

The current state in technology is highly dynamic. For an orchestra that has evolved from its inaugural concert back in 1887 and now in its 140th season, the role of technological change provides the most solid avenue of establishing an IT strategy going forward. Currently, the Orchestra has grown to a level where it reaches its audience through radio, television and over the internet (Boston Symphony Orchestra, 2017). Effectively, the most promising portal in the current age lies in the use of internet and mobile phones as a way of further spurring its growth and spreading out its ubiquity. A suggested IT plan would involve creating a mobile app for a symphony that enables the user to access the physical features in the live symphony through the touch of their hands. The mobile platform as an end provides the most promising opportunity of growth and spread that would capitalize on the large number of users in the United States and indeed the rest of the globe (Statista, 2017).

6.1 Ethical IT Skills in Managing and Securing Client Data for the Mobile App

The new mobile app will be developed and used under the secure end to end encryption model which aims to protect user data. Credit information can only be accessed by the owner and through the role of encryption, it will be impossible to cut through and potentially expose

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vulnerable user information to third parties. Additionally, the app will operate under the third-party development agreements that are currently in use with both Apple and Android where the user is entirely entitled to the information (Boice, 2014). Under this arrangement, the operating system ownership only acts as the carrier while the owner reserves the right to all user information. Equally, the current technology space is highly secure, and the basic role of encryption is by itself a fool proof mechanism that would ensure that user and donor data is managed and secured in a highly effective manner.

6.2 Technological Dimensions and Decision-Making Frameworks

The main aim behind this development lies in the need to provide value and convenience to the user at the comfort of their palms. The main utility that would have been incorporated in this case include enhanced visibility of the brand and the ability to heighten their competitive acumen in the process. For this purpose, the mobile app will include an ability for the users to exercise autonomy through easy to decipher instructions and greater control over its operations and function. Beyond the security consideration that is meant to ensure the safety of user data, the other components will be largely left under the control of the individual user (Business of Apps, 2017).

6.3 Risk and Return Information for a Mobile App

As a nonprofit institution, SBSO depends on direct donations in funding over 70 percent of its operations. The role of a mobile app as part of its IT initiatives would serve to optimize its operations and spur its revenues by enabling the entity to harness on the direct benefits that accrue from developing mobile apps. At a glimpse, a new app will enable SBSO to enhance its direct revenue generation, user acquisition and provide additional utilities in the aim of increasing the value in the established experience which is being given to the audience. A look at the risk and return elements further illustrates that the feasibility of this initiative is very high. Beyond the initial development costs, the app project will incur zero additional costs in customer acquisition (Boston Symphony Orchestra, 2017). Equally, the costs of maintenance are projected to be significantly low. Organically speaking, the Orchestra would have

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created a full fletched performance line without making a single dime of investment into the process of marketing. Regarding return, the firm under its current operating model is bound to reap maximum benefits through the millions of users that would access its service through the mobile app platform and consequently work as a vibrant user base and source of direct donations towards its operations.

6.4 Business Requirements and Formulated Technology Solutions

The operating framework for the establishment of a mobile app for the Symphony would basically focus on the user demographic components in addition to the safety and operating considerations from the provider's end. For the app development process, the firm will have to consider the initial cost of setting up and rolling out the app through the different carriers, mainly Apple and Android. Subsequently, the maintenance component would involve taking care of security, both for the user and the firm as the provider of this solution from third party intrusion (Business of Apps, 2017).

7. Conclusion

Creativity thrives when people work together on a team. Collaborating on a project creates an enthusiasm for leaning and also maximizes the shared knowledge and helps the team members learn new skills (Mattson, 2015). In this project, our team members have co-operated with each other during all the stages of the project. The team had put in all the efforts to find the required data and we were successful too. All the team members were friendly and delivered their assigned tasks on time. Small teams have various challenges too any and many of the problems are similar to every team face- disagreements, unclear priorities (Harrin, 2016). It was a successful and educative journey delivering the project deliverables and meeting the course requirements on proper time with appropriate material. All of us were very communicative with each other to take advice or ideas of other members. All of the team members have devoted immense effort in the project and thus we have made our project a success. Without the right team in place, any strategy and plan has the potential of completely falling apart (Palmer, 2016).

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The project team was able to successfully offer an IT solution that met the needs and requirements of the Client. Moreover, in our research on the effectiveness of mobile app usage for improved concert attendance and audience engagement, we evaluated three symphony orchestras in relation to proportion of IT expenditures and revenues. Additionally, we examined age in relation to concert attendance and mobile app usage and found higher propensities among certain age groups to use mobile apps as well as attend an orchestral performance. Our findings suggest potential for the use of mobile apps by symphony orchestras as a means of engaging their audiences and suggests focusing on the 25-34 and 55-64 age groups. The BSO sets the example for aspiring orchestras looking to grow in size and revenue. Further areas of study can include other areas of IT such as customer relationship management (CRM) and business intelligence (BI) and analytics tools. Most importantly, we hope shining a light on one segment of the performing arts will invite others to engage in the necessary conversation about the significance of the arts in our society and in education. Only then can we begin to bridge the gap between science and art and elevate the performing arts once again, this time leveraging the power of technology.

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